

AIR WAR COLLEGE

AIR UNIVERSITY

RESCUE OPERATIONS CENTER:  
THE FUTURE COMMAND AND CONTROL NODE FOR  
PERSONNEL RECOVERY OPERATIONS

*by*

Denis P. Doty, Lt Col, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

17 February 2010

## **DISCLAIMER**

The views expressed in this academic research paper are those of the author and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

## Contents

DISCLAIMER CERTIFICATE.....	i
CONTENTS.....	ii
BIOGRAPHY.....	iii
INTRODUCTION.....	1
RESCUE DOCTRINE AND HISTORY.....	3
RESCUE OPERATIONS CENTER DESCRIPTION.....	6
Rescue Operations Center Functions.....	7
Requirements.....	7
Concept of Operations.....	8
OPERATIONAL USAGE .....	9
Defense Support to Civil Authority.....	10
Humanitarian Relief.....	10
Non-combatant Evacuation Operations (NEO).....	12
Irregular Warfare.....	12
Building Partnership Capacity.....	13
WHEN DO WE USE THE RESCUE OPERATIONS CENTER.....	14
RECOMMENDATIONS/WAY AHEAD.....	18
CONCLUSION.....	19
BIBLIOGRAPHY.....	21

## **Biography**

Lieutenant Colonel Denis Doty is currently an Air War College student in the class of 2010. He commanded an Operations Support Squadron in Davis-Monthan AFB, Arizona and a deployed HC-130 Expeditionary Rescue Squadron in Djibouti, Africa. He completed flying tours in B-52s at Minot AFB, North Dakota; in MC-130Ps at Eglin AFB, Florida, Kadena AB, Japan, and Hurlburt Field, Florida; and in HC-130s at Moody AFB, Georgia and Davis-Monthan AFB, Arizona. In addition, he served a staff tour as Chief, Counterterrorism Branch of the J-5 plans division at U.S. Special Operations Command, MacDill AFB, Florida. Lt Col Doty is a Master Navigator with 69 combat hours and more than 4,000 hours in the B-52, MC-130P, HC-130, and C-130E aircraft. In addition, he has flown multiple combat tours of duty in Operations PROVIDE COMFORT, NORTHERN WATCH, and ENDURING FREEDOM.

He holds a Bachelor of Science from Oklahoma State University. In addition, he holds a Master's of Science degree in Aeronautical Science from Embry-Riddle University; a Master's of Arts degree in National Security and Strategic Studies from the Naval War College; and is a graduate of the Armed Forces Staff College. Lieutenant Colonel Doty is a distinguished graduate of the B-52 Combat Crew Training and C-130 Tactical Navigation Schools. In addition, he was named Air Force Special Operations Command's Training Officer of the Year and won the Air Force Association's Hoyt Award as the Air Force's Refueling Aircrew of the Year. Finally, he was a top-25-percent graduate of the Naval Command and Staff College.

## Introduction

*“It is my duty as a Pararescueman to save life and to aid the injured. I will be prepared at all times to perform my assigned duties quickly and efficiently, placing these duties before personal desires and comforts. These things I do, THAT OTHERS MAY LIVE.”*

*– The Air Rescueman’s Creed, Lt Col Richard Kight<sup>1</sup>*

In August 2005, Hurricane Katrina’s destruction caused one of the biggest search-and-rescue (SAR) operations in United States history. The 347<sup>th</sup> Rescue Wing at Moody AFB, in concert with other SAR contingents, deployed to Jackson, Mississippi where it was responsible for saving over 4,300 lives during the operations’ 11 days. Despite the outstanding accomplishments, the wing dealt with significant communications and command-and-control (C2) issues. According to Brigadier General Callahan, the then 347<sup>th</sup> Rescue Wing commander, “C2 of the overall air effort was initially very poor. The individual services and organization executed the C2 of their assets properly. However there was no coordination between services and organizations initially and even after it was beginning to solidify (day 8) there still was no single JFACC.”<sup>2</sup> This was one of the many problems the responders had in obtaining, communicating, and managing information during this operation.<sup>3</sup> To help alleviate the C2 concerns, the 23<sup>rd</sup> Wing (redesignated from the 347<sup>th</sup> Rescue Wing in 2007) started discussing the Rescue Operations Center concept in late 2007. This paper will show how the implementation of the Rescue Operations Center (ROC) concept will have a significant positive impact for the conduct of personnel recovery (PR) operations and responses by streamlining

---

<sup>1</sup> [http://en.allexperts.com/e/a/ai/air\\_force\\_pararescue.htm](http://en.allexperts.com/e/a/ai/air_force_pararescue.htm) and <http://www.pararescue.com/>

<sup>2</sup> Callahan, Brigadier General Joseph, Joint Staff J-5, The Pentagon, VA. To the author. E-mail, 13 November 2009.

<sup>3</sup> US Senate. *Hurricane Katrina: A Nation Still Unprepared*. Special Report of the Committee on Homeland Security and Governmental Affairs, 109<sup>th</sup> Cong., 2<sup>nd</sup> sess., S.Rept 109-332, p. 9.

communication, the decision-making process, and decentralization of command-and-control functions from the Combined Air Operations Center (CAOC).

Effective command and control (C2) of PR forces is absolutely necessary for mission accomplishment. According to Major Mark DiPaolo, “When you look at historical data, what hurts us isn’t the speed of our helicopters, our limited weapons, or our limited range. It’s command and control.”<sup>4</sup> Joint Pub 3-50, Personnel Recovery, states “The Joint Force Commander (JFC) may task organize elements of the joint force by Service or functional capability. They may elect to retain PR C2 authority at their level or task a subordinate component commander to coordinate PR for the joint force.”<sup>5</sup> Therefore, it is the responsibility of the joint force commander to determine who is responsible for overall C2 of personnel recovery operations. This C2 does not need to be centralized at the CAOC-level for operations across the range of military operations. Although the centralization of PR operations in the Joint Personnel Recovery Center at the CAOC is most optimum during major combat operations, the decentralization away from the CAOC during other types of operations gives the Rescue commanders added flexibility. As Lt Col Hinote notes, “A final—and perhaps the most important—consideration is determining who in the command-and-control construct has the highest amount of situational awareness.”<sup>6</sup> Moving the C2 of Rescue forces gives the commander at the lower-level the ability to monitor and move forces to where it is absolutely necessary while maintaining that essential link to command elements for accountability and mission oversight. The Joint Force Air Component Commander (JFACC) issues his commander’s intent and maintains situational awareness while the downrange commander

---

<sup>4</sup> Wormley, Michael A. *Combat Search and Rescue: Searching the History; Rescuing the Doctrine*. School of Advanced Aerospace Studies, Maxwell AFB, AL, June 2003, p. 5.

<sup>5</sup> Joint Chiefs of Staff. Joint Publication 3-50, *Personnel Recovery*, 5 January 2007, B-4.

<sup>6</sup> Hinote, Clint. *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?* Air Force Research Institute Papers, Maxwell AFB, AL, March 2009, p. 62.

assumes the risk for mission execution. Before defining the solution, we must look at Rescue's recent doctrine and past to understand the situation we currently find ourselves.

## Rescue Doctrine and History

Personnel Recovery, especially the Air Force's Combat Search and Rescue (CSAR) forces, has been a topic of concern in recent years. Because of the lack of understanding throughout the military community, PR is an area that many senior leaders do not truly comprehend. General officers use the terms personnel recovery, combat search and rescue, and rescue interchangeably when each are unique.<sup>7</sup> The definitions of these terms show that there is a distinct difference.<sup>8</sup> Personnel Recovery "is the sum of military, diplomatic, and civil efforts to affect the recovery and reintegration of isolated personnel."<sup>9</sup> Department of Defense policy states that PR is highly important to the United States government.<sup>10</sup> Because it spans all of government, the Secretary of Defense (SecDef) deemed the Commander of U.S. Joint Forces Command as the executive agent for PR, less policy.<sup>11</sup> To meet the PR need, the Services, including the Air Force, and the United States Special Operations Command (USSOCOM) are

---

<sup>7</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 16 October 2009.

<sup>8</sup> Joint Pub 3-50 defines the following terms: "**personnel recovery**. The sum of military, diplomatic, and civil efforts to prepare for and execute the recovery and reintegration of isolated personnel. Also called PR. **combat search and rescue**. The tactics, techniques, and procedures performed by forces to effect the recovery of isolated personnel during combat. Also called CSAR; **hostage rescue**. A personnel recovery method used to recover isolated personnel who are specifically designated as hostages; **nonconventional assisted recovery**. Personnel recovery conducted by indigenous/surrogate personnel that are trained, supported, and led by special operations forces, unconventional warfare ground and maritime forces, **search and rescue**. The use of aircraft, surface craft, submarines, and specialized rescue teams and equipment to search for and rescue distressed persons on land or at sea in a permissive environment. Also called SAR. **unconventional assisted recovery**. Nonconventional assisted recovery conducted by special operations forces. Also called UAR."

<sup>9</sup> Joint Chiefs of Staff. Joint Publication 3-50, *Personnel Recovery*, 5 January 2007, p. ix

<sup>10</sup> Department of Defense (DOD) Directive 3002.01E. *Personnel Recovery in the Department of Defense*, states "preserving the lives and well-being of U.S. military and DoD civilians and contractors who are besieged, captured, detained, or interned is one of the highest priorities of the Department of Defense. Hence, the Department of Defense has an obligation to train, equip, and protect its personnel, prevent their capture and exploitation by adversaries, and reduce the potential for using isolated personnel as leverage against U.S. security objectives." Also, Department of Defense (DOD) Defense Prisoner of War/Missing Personnel Office. Strategic Plan 2005-2010. January 2005, p. 8.

<sup>11</sup> Department of Defense (DOD) Directive 3002.01E. *Personnel Recovery in the Department of Defense*, 16 April 2009.

responsible to prepare and present forces to the geographic combatant commanders for PR tasks as specified by the JFC.<sup>12</sup>

Due to its importance, the Air Force deemed Personnel Recovery as a core Air Force function with Combat Search and Rescue, Civil Search and Rescue, Humanitarian Assistance, etc. being operational capabilities.<sup>13</sup> In addition, Air Force Doctrine Document (AFDD) 2-1.6, *Personnel Recovery Operations*, defines CSAR as the Air Force's preferred mechanism for personnel recovery execution in uncertain or hostile environments and denied areas.<sup>14</sup> Having the high-end CSAR skills necessary to conduct a PR response deep inside hostile territory is what makes AF Rescue Forces the first choice for rescues, even though other forces can and have conducted CSAR-type missions.<sup>15</sup> History shows this time and again.

There are numerous examples where Air Force Rescue forces conducted operations behind enemy lines to rescue their comrades. As documented by historian Dr. Earl Tilford, the Air Force was responsible for the rescue of 3,883 personnel during the Vietnam War from all varieties of "at risk" situations during that long conflict.<sup>16</sup> Despite the tremendous showing in Vietnam, the CSAR mission area degraded over time prior to the Desert Storm. Air Force Special Operations Command, instead of the traditional AF CSAR forces, conducted all CSAR missions during Desert Storm, Operation Allied Force, and several other contingencies prior to the beginning of Operation Enduring Freedom (OEF).<sup>17</sup> Since then, Air Force Rescue forces

---

<sup>12</sup> Joint Chiefs of Staff. Joint Publication 3-50, *Personnel Recovery*, 5 January 2007, p. xi, specifically states "The Services and the United States Special Operations Command (USSOCOM) are responsible to prepare and present forces to the geographic combatant commanders that are organized, trained, and equipped to perform PR tasks consistent with the roles and functions established in law and by the President and SecDef and the missions specified by the JFC."

<sup>13</sup> Briefing to 23rd Wing Commanders Conference. Subject: Personnel Recovery Defined, 27 October 2009.

<sup>14</sup> Air Force Doctrine Document (AFDD) 2-1.6. *Personnel Recovery Operations*, 1 June 2005, p. 30.

<sup>15</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009

<sup>16</sup> Whitcomb, Darrel D. *Combat Search and Rescue in Desert Storm*. Air University Press, Maxwell AFB, AL, September 2006, p.8.

<sup>17</sup> dePalo, Colonel Lee. *USAF Combat Search and Rescue: Untapped Combat Power*. Air War College Maxwell Paper Number 35. Air University Press, Maxwell AFB, AL, September 2005, p. 6.



performed superbly during OEF and Operation Iraqi Freedom by saving thousands of U.S. and coalition lives through its use of its CSAR, SAR, Medical Evacuation (MEDEVAC), and Casualty Evacuation (CASEVAC) operational capabilities. Although these rescues saved many lives, only one save met the joint definition of CSAR.<sup>18</sup> Due to this lack of CSAR saves, the Air Force cannot expect its rescue forces to conduct CSAR only. This has not always been the case.<sup>19</sup> Although Air Force Rescue forces may prepare for CSAR as a predominant task, they are capable of conducting several other missions.

Based on the flexibility and adaptability of today's Air Force Rescue forces, the Air Force can also provide operational capabilities geared toward the conduct of operations across the range of military operations. They did so admirably in support of humanitarian relief operations in the wake of natural disasters such as Hurricane Katrina, Rita, Gustav, and Ike. As noted earlier, there were significant issues as the Air Force saved over 4,300 personnel after the floods ravaged New Orleans in the wake of Hurricane Katrina. To help improve the C2 infrastructure, the 23<sup>rd</sup> Wing developed the Rescue Operations Center concept in late 2007. This concept got its first test during disaster relief operations after Hurricanes Gustav and Ike in September 2008. It was a success that resulted in saving 27 lives and assisting in saving over 400 more.<sup>20</sup> Colonel Todorov, the 23<sup>rd</sup> Wing commander, and Colonel dePalo, the 563<sup>rd</sup> Rescue Group commander, both noted how effective the C2 structure became during these two

---

<sup>18</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009

<sup>19</sup> Kuehn, James. "PR/CSAR: A USSOCOM Core Task?" Air Command and Staff College, 2005, p. 13, states the Air Force has focused "on the singular emphasis of downed aircrew resulting in a force structure solely dedicated to CSAR operations and the entire concept of CSAR forces dedicated almost exclusively to recovery of downed aircrew conflicts with airpower theory tenants of flexibility."

<sup>20</sup> This was noted during the authors personnel experience supporting the relief operations at Ellington Field and Randolph AFB, TX in September 2008.

hurricanes as a result of developing the Rescue Operations Center.<sup>21</sup> The vast improvement shown between the operations ISO of Katrina and Ike relief operations were a result of the unified approach to PR responses controlled in a decentralized manner that synchronized Title 10, Title 32, state and local government rescue capabilities.<sup>22</sup> This synchronization was done through the ROC.

### **Rescue Operations Center Description**

According to AFDD 2-1.6, there are three CSAR components: (1) the command, control, and coordination node; (2) the recovery forces; and (3) the isolated personnel.<sup>23</sup> Although this statement is implicitly tied to CSAR, one could use the same logic for the Rescue Operations Center (ROC). The 563<sup>rd</sup> Rescue Group, with the 563<sup>rd</sup> Operations Support Squadron as the lead unit, developed the ROC concept in late 2007 and early 2008. The desire to have an available command and control element to deploy organically in support of rescue assets drove the decision to develop this concept. Historically, Rescue forces, whether in support of (ISO) CSAR or SAR operations, would deploy while counting on several different tactical operations centers (TOC) specifically designed to support non-Rescue weapons systems. This created a lack of synergy and detracted from any unity of effort during PR operations.<sup>24</sup> To produce the synergistic effect needed, the Rescue Group developed the ROC to lower the demand for several TOCs and consolidate and co-locate all of the necessary functions such as planning, operations, intelligence etc., into one fusion operations center.

---

<sup>21</sup> Todorov, Colonel Kenneth, NORTHCOM Special Assistant to the Commander, NORTHCOM, Petersen AFB, CO. To the author. E-mail, 14 December 2009 and dePalo, Colonel Lee, Vice Commander, 13 Wing, Andrews AFB, MD. To the author. E-mail, 1 February 2010.

<sup>22</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>23</sup> Air Force Doctrine Document (AFDD) 2-1.6. *Personnel Recovery Operations*, 1 June 2005, p. 11 and Latta, Clifford W. Lt Col. *U.S. Air Force Air Combat Command Takes Control of Combat Search and Rescue: An opportunity to Re-energize the Unity of Effort*. Naval War College, 15 May 2006.

<sup>24</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

## **Rescue Operations Center Functions**

In general terms, Rescue forces would use the ROC to control PR operations in a decentralized manner across the spectrum of military operations. Although this could include using it for major combat operations (MCO), the ROC's primary focus is for operations where there is (1) no mechanism already in place to support PR responses, and (2) when reach-back to a standing AOC unnecessarily detracts from a time-sensitive PR response.<sup>25</sup> The ROC is employed when the Rescue Group deploys in support of operations like humanitarian relief, civil support after natural disasters, and non-combatant evacuation operations (NEO). Although the ROC can deploy to support outside requirements, it normally deploys only in support of 23 Wing operations. This is an important distinction to make as we talk about the recommendations to establish its own unit type code (UTC).<sup>26</sup> The UTC will allow the combatant commanders the ability to request the ROC function when rescue forces deploy in support of their operations. In addition, with the ROC having its own UTC, the Air Force can provide the manpower, equipment, and sustainment needed to maintain the ROC in future years.

## **Requirements**

The Group tailors the ROC personnel and equipment size according to what type of operational capabilities Rescue forces are tasked to provide. There are four different package sizes ranging from light to heavy. The ultra-light package requires 20 personnel and two pallet positions filled with mostly communications equipment. This group uses this package when they have the capability to secure facilities to work in (ie. Hangers or other operations centers types). The light package requires 20 operators, one main operations tent and equipment associated with

---

<sup>25</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>26</sup> A Unit Type Code is a five-character, alphanumeric code that uniquely identifies each unit of the Armed Forces.

the package. The medium-sized package includes an increase in personnel and equipment. Finally, on the other end of the spectrum is the heavy package that requires approximately 50 people and five pallets worth of space on airlift aircraft. This equates to two C-130E aircraft loads of equipment. Currently, the group has organic C-130E assets to self-deploy if necessary.

The necessary equipment includes such items as communications (VHF, UHF, SATCOM, NIPRNET, and SIPRNT), planning, intelligence, and logistical tools. The size of the package increases depending on the mission scope. Manpower required to support the ROC includes contracting, medical personnel (flight doctors and medical technicians), a first sergeant, force protection, safety, administrative, current and future operations (A-3 and A-5), intelligence, logistics, and communications specialists. Most of these functions are organic to the group. However, there is a need for contracting and force protection support as the group does not have its own organic capability. While the 347<sup>th</sup> and 563<sup>rd</sup> Rescue Groups already have communication officers assigned to provide communications support, Air Combat Command should validate the requirement for additional communications personnel to support the day-to-day ROC requirements.

### **Concept of Operations**

The Rescue Operations Center is a rapidly deployable mini-Air Operations Center. It is capable of providing C4 for AF Rescue MDSs responding to any PR requirement; i.e., CSAR, Humanitarian, or Defense Support to Civil Authority (DSCA) tasking. Primarily manned by the Operations Support Squadron, the ROC allows the flying squadrons to focus on performing the operational mission.<sup>27</sup> The ROC provides an efficient, capable, and rapidly deployable Rescue commander's A-staff with the necessary command, control, communications, and computers (C4) necessary to perform its operational functions. The initial package normally deploys within

---

<sup>27</sup> Briefing to General Renuart. 23rd Wing. Subject: Rescue Operations Center, 26 July 2009.

24-hours with 3-to-14 days of organic requirements before needing follow-on support. Thus, the ROC is normally used on short-duration operations. Set-up time to be able to control operations is less than four hours. The package provides robust operational support from all A-staff functions including administration, operations, intelligence, and communications. The team can operate from locally procured fixed facilities or from the tents maintained by the groups. In addition, the deployed team can maintain reach-back to the home AOC so the JFACC or other supported commanders can reach forward to the deployed rescue units.<sup>28</sup> The ROC provides improved SATCOM, air-to-ground communications, and internet capabilities organic to the Rescue Groups.

The key enhancement the ROC gives the combatant commander is the flexibility to move forward from an initial staging base to a forward staging base at a moment's notice while maintaining C4 of its forces.<sup>29</sup> This includes instances where the ROC may already be forward deployed in support of other operations. Tearing the ROC down to move it forward takes a short amount of time, with it up-and-running at the new location in minimal time. It could take less than 12-hours to get the capability ready for operations from notification to set-up at the new location. The only variable is getting the personnel and equipment transported from one location to the other. So, when do we use this ROC and where?

## **Operational Usage**

The Rescue Operations Center's primary use is to support operations where there is no other PR command-and-control node already in place, or when reaching back to an AOC during a PR response creates unnecessary risk during mission execution. The ROC will forward deploy to austere, bare-based airfields in direct support of PR responses. This could include

---

<sup>28</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>29</sup> Briefing to General Renuart. 23rd Wing. Subject: Rescue Operations Center, 26 July 2009.

anything in the entire range of military operations (ROMO) whether MCO, disaster relief or humanitarian assistance. However, Rescue forces normally reach back to an existing Joint Personnel Recovery Center (JPRC) during MCO to unify a Joint Force Commander's collective PR capability.<sup>30</sup> Although supporting MCO<sup>31</sup> is possible, the typical operation where the ROC deploys is in support of Defense Support to Civil Authorities, humanitarian assistance, and other overseas disaster relief operations.

### **Defense Support to Civil Authority**

Defense Support to Civil Authority (DSCA) taskings includes rescuing civilians in the aftermath of natural disasters within the United States. Normally, the state involved requests the support of Department of Defense (DoD) assets to augment their local and state law enforcement and Title 32/guard forces. DoD support in a domestic disaster is in support of the primary and secondary agencies. This effectively occurred during response to hurricane relief operations after Hurricane Ike hit Galveston, Texas in September 2008. United States Northern Command (NORTHCOM) normally takes operational control (OPCON) of Rescue forces to ensure there is adequate command oversight. In this particular instance, control was decentralized and resided under the Rescue Forces Commander in the Rescue Operations Center.<sup>32</sup>

### **Humanitarian Relief**

Humanitarian relief operations include operations within the United States and overseas. OCONUS deployment possibilities include supporting coalition partners during the aftermath of

---

<sup>30</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>31</sup> For Major Combat Operations (MCO): Normally a JPRC is established within the CAOC for major combat operations. However, this set-up may not be the most optimum. For example, command and control at the beginning of OEF was unclear at best. TF-Dagger established an operations center that initially lacked the connectivity with the CAOC. (personal note from the author who deployed ISO of OEF) Therefore, the initial Rescue forces tasked to provide CSAR capability could have used the ROC. Although the relationship between TF-Dagger and the CAOC improved over time, a Rescue Operations Center would have established a more effective C2 node quicker and easier.

<sup>32</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

natural disasters such as earthquakes, floods, and tsunamis. Past disaster relief missions have highlighted where a ROC-type entity provided successful communication and C2 effectiveness. During relief operations in Bangladesh, a special operations disaster relief team deployed with a ROC-like support package to run their C2 node. This entity was the first on the ground and ensured good initial C2 until follow-on forces could arrive.<sup>33</sup> On the contrary, initial communication connectivity during tsunami relief operations in Thailand and Indonesia proved to be a stumbling block. A ROC-like capability would have enhanced the communications connectivity for the forward-operating HH-60 helicopters and special operators from Okinawa.<sup>34</sup> Another classic case of where a ROC-like entity would have worked well occurred during the Mozambique flood relief in 2000. The Air Force deployed rescue helicopters to support the mission. Despite having a Joint Logistics Operations Center (JLOC), there was no true C2 node the forces could coordinate with.<sup>35</sup> As Lt Col Dreyer stated, the “Civil Military Operations

---

<sup>33</sup> Smith, Charles R. *Angels from the Sea: Relief Operations in Bangladesh, 1991, U.S. Marines in Humanitarian Operations*. History and Museums Division, HQ U.S. Marine Corps, Washington D.C., 1995. states “A Disaster Relief Team (DART) from the 1<sup>st</sup> Special Forces Group A (Airborne) was flown from Okinawa on board two HC-130 Hercules aircraft from the 17<sup>th</sup> Special Operations Squadron. The team was composed of 36 Special Operations personnel, including command and control, operations, intelligence, logistics, communications, medical, and weather personnel (comparable to the ROC structure).” (p. 29-30) This team provided the initial C2 net and portions moved forward to Chittagong (p. 34-36). The JTF-commander, MajGen Stackpole initially projected a 14-day commitment (comparable to the length of time for ROC deployments) for the operation. (p. 36).

<sup>34</sup> Elleman, Bruce A. *Waves of Hope: The U.S. Navy’s Response to the Tsunami in Northern Indonesia*. Naval War College Papers 28, Newport, RI, February 2007, states “Due to the particular joint task force structure adopted during the first days of the operation-Utapao was designated as the headquarters-communications proved to be stumbling block. It took time for Utapao to acquire global communications, so the advanced team was walking into a black hole. One problem was moving communications equipment to Utapao (the ROC would have improved the communication capability).” (page 70-75) In addition, Airman Magazine, “Airman of Mercy,” March 2005 states “the HH-60s were flying missions to feed and supply more than a million people in Sri Lanka and the 353<sup>rd</sup> carried doctors from Portugal.” (p. 5-6).

<sup>35</sup> Christie, Frances and Hanlon, Joseph. *Mozambique & The Great Flood of 2000*. Oxford, England and Bloomington, IN: The International African Institute, 2001, p.80. In addition, “the JLOC was never given a telephone line throughout the entire operation.” Co-locating the ROC with the JLOC could have provided the necessary communications support for both.

Center (CMOC) was really just a U.S. presence”<sup>36</sup> and did not provide much capability. A ROC-like entity could have provided the necessary tools to meet the C2 need.<sup>37</sup>

### **Non-combatant Evacuation Operations (NEO)**

Although AFSOC has supported most NEO missions in the recent past, Air Force Rescue forces can provide this type of support to the combatant commanders with little to no risk based on their high-end CSAR capabilities.<sup>38</sup> NEO is normally very short in duration and can occur anywhere in the world. Because the world’s political environment is very volatile and conditions in a country can change very rapidly, a capability like the ROC could provide expeditious support when needed worldwide. A prime example is when a ROC-like entity deployed to support the 2003 NEO in Liberia. A team of 40 operators deployed in less than 24-hours to run the operations center to aid in evacuating the American embassy.<sup>39</sup> The prompt response to deploy the ROC ensured the safe return of 73 Americans.<sup>40</sup>

### **Irregular Warfare**

Irregular warfare (IW) is defined as “A violent struggle among state and non-state actors for legitimacy and influence over the relevant populations. IW favors indirect and asymmetric approaches, though it may employ the full range of military and other capabilities, in order to erode an adversary’s power, influence, and will.”<sup>41</sup> In addition, the Air Force codified its requirement to conduct IW in 2007 by publishing its own irregular warfare doctrine. An important Air Force requirement is building partnership capacity and its Rescue forces are

---

<sup>36</sup> Ibid, p.67.

<sup>37</sup> [http://www.specialoperations.com/Operations/Atlas\\_Response//Default.htm](http://www.specialoperations.com/Operations/Atlas_Response//Default.htm)., “EUCOM deployed a Humanitarian Assistance Survey team (HAST) to survey the damage. EUCOM deployed additional personnel to support the HAST that included a team comparable to a ROC team (doctor, contractor, logistics planner, and communication personnel.”

<sup>38</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>39</sup> Briefing to 85<sup>th</sup> Group Commander. 56<sup>th</sup> Rescue Squadron. Subject: Personnel Recovery Capabilities, 10 August 2003 and Hartnett, Brett A. Major. After Action Report: Combat Rescue Ground Operations at the U.S. Embassy, Monrovia, Liberia, 23 July 2003. Of note, “there were significant indigenous casualties and numerous gunfire exchanges.” (p.3)

<sup>40</sup> Ibid, p.6.

<sup>41</sup> Joint Chiefs of Staff. Joint Publication 1, *Doctrine for the Forces of the United States*, 20 March 2009, p. I-1.



uniquely poised to advance this mission. The Air Force must become the advocate for its Rescue forces to conduct IW operations because this requirement will continue to grow in the future. Meggett states “PR support to IW looks significantly different from normal conceptions of theater CSAR. The ability of Combat Rescue forces to provide a wide spectrum of direct and indirect support to the theater IW campaign, from MEDEVAC of wounded local civilians to *in extremis* recovery of SOF, gives the JFC or JTF commander a very flexible and rapid reaction airpower tool.”<sup>42</sup> The ROC can support missions across the spectrum of IW by providing the decentralized control necessary for such operations, while ensuring the need for command oversight is maintained with the Air Force Forces Commander.<sup>43</sup>

### **Building Partnership Capacity**

Air Force Rescue forces, although currently stretched very thin, can provide combatant commanders the ability to engage other countries military forces to help them develop their own Rescue force and CSAR/SAR capabilities. As Colonel dePalo stated, “Today’s CSAR force can ably execute the CSAR function, but there is too little probability of CSAR mission tasking for the force to remain exclusively focused. In addition, USAF CSAR is a tool that can conduct personnel recovery as well as ancillary missions across the spectrum of challenges.”<sup>44</sup> This is important because ACC included engagement in their CAF strategic plan. It states that “*Persistent Engagement* is how the CAF sets conditions and shapes the environment to one conducive to ensuring achievement of combatant commander and national objectives.”<sup>45</sup>

---

<sup>42</sup> Meggett, David C. *Evolution of Rescue: Personnel Recovery for a New Environment*. Naval Post Graduate School, Monterey, CA, December 2007.

<sup>43</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>44</sup> dePalo, Colonel Lee. *USAF Combat Search and Rescue: Untapped Combat Power*. Air War College Maxwell Paper Number 35. Air University Press, Maxwell AFB, AL, September 2005, p. 40.

<sup>45</sup> Air Combat Command 2008 Strategic Plan. *Securing the High Ground: Dominant Combat Air Force for America*. 28 July 2008, p. 11, also states “It is a holistic approach to shape the underlying conditions that foster conflict, assure and

Therefore, using ACC's Rescue forces around the globe for missions other than those that only require CSAR capability to rescue downed pilots is crucial to the longevity of the mission set.

### **When do we use the Rescue Operations Center?**

The lack of a formal C2 architecture during Hurricane Katrina relief operations caused significant issues among all forces involved and drove the requirement to establish the ROC. Units involved in these operations came from all services, the Coast Guard, and local law enforcement. Communications was a concern from the outset of operations. The communication infrastructure at the deployed location in Jackson, Mississippi did not become truly operational until two full days into the mission. It was a pick-up game with pieces-and-parts of various squadrons' communications equipment providing the backbone of the communications set-up.<sup>46</sup> The lack of a functioning operations center at the Air Force Rescue Coordination Center (AFRCC) located at 1<sup>st</sup> Air Force at Tyndall AFB, added to the difficulties. There was no coordinating agency to allocate missions, deconflict sorties, and maintain an overall C2 picture of the ongoing operations. Despite the professionalism displayed by all participants to accomplish the mission, this sub-optimal C2 structure caused serious deconfliction issues. This was caused by a lack of communications equipment from the outset.

The Rescue Operations Center adds organic communications capability to the wing and group enabling the Rescue force to deploy without having to rely on combat communications groups for support. This capability would have significantly improved the JTF-Katrina Expeditionary Group commander's ability to control his forces in a decentralized manner while maintaining instantaneous connectivity with the higher command structure for accountability and

---

build partner capacity, deter actors from attacking our interests and disrupt adversary actions through forward presence and credible combat capability.”

<sup>46</sup> After Action Report. 347 Expeditionary Rescue Group, 22 September 2005, p.13.

mission oversight.<sup>47</sup> The Air Force threw masses at the problem, a total of over 70,000, but the actions of those involved were uncoordinated. The forces involved counted on luck and hoped to find all the necessary survivors without running into each other.<sup>48</sup> In addition, there was no coordination between services and organizations initially and even after it was beginning to solidify on the eighth day because there still was no single JFACC.<sup>49</sup> Had the ROC existed, and more importantly had the joint force commander recognized and designated it as the single C2 node for coordinating rescue operations across all Services in a decentralized manner, we would have seen a much more precise and coordinated effort toward saving lives.

In addition to the problems during Hurricane Katrina relief operations, the same type of C2 issues occurred at the beginning of OEF and OIF. There was a lack of communications and other organic capabilities that caused severe degradations during the outset of combat operations. The Rescue forces tasked to provide CSAR capability during Operation Iraqi Freedom initially deployed as part of an Air Expeditionary Force. However, they had to rapidly move well beyond friendly forces to forward operating locations (FOLs) within Iraq. Many members of the force noted in a study done by Major Cline in December 2004 that they thought they had to cobble together the ad-hoc communications and logistical support for these FOLs. In addition, one HH-60G pilot noted that "...under ACC, CSAR forces had no capability to operate autonomously from forward or austere locations. Relying on other forces for base operating support was a real thorn in the side."<sup>50</sup> The Air Force, at the time, had neglected PR, and specifically its CSAR capability, for two decades and little has changed since then. The creation of the Rescue

---

<sup>47</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>48</sup> Todorov, Colonel Kenneth, NORTHCOM Special Assistant to the Commander, NORTHCOM, Petersen AFB, CO. To the author. E-mail, 14 December 2009.

<sup>49</sup> Callahan, Brigadier General Joseph, Joint Staff J-5, The Pentagon, VA. To the author. E-mail, 13 November 2009.

<sup>50</sup> Cline, John D. "Under New Management: Will America's Dedicated CSAR Forces Finally Strive in AFSOC?" Naval Post-Graduate School, 2004, p. 17-18.

Operations Center will increase Air Combat Command's capability to deploy Rescue forces capable of conducting personnel recovery operations across the entire spectrum of combat and peacetime operations.

The use of the Rescue Operations Center provides the most effective method of ensuring command oversight and mission accountability while controlling Air Force Rescue forces in a decentralized manner, during humanitarian relief operations for instance. One of the primary reasons for this is the importance of effective coordination between Air Force Rescue forces and the need to unify other joint units, coalition assets, and interagency partners who co-locate their own rescue capabilities with those of the Air Force.<sup>51</sup> Outside of MCO, the Rescue Commander must coordinate with local agencies such as the American embassy, non-governmental organizations, international organizations, host-nation assets, and many more. The ROC can facilitate the coordination between these entities to ensure the correct support is getting to the affected populace.

Another good example of when to use the ROC is building partnership capacity through engagement opportunities. Winning the ideological battle – the contest for hearts and minds – means routine frequent engagement in the weak and failing states from North Africa to the Pacific.<sup>52</sup> As a former exercise planner in the Pacific AOR, I personally organized several exercises to help foreign militaries improve their search and rescue capabilities. This force multiplier allows the foreign country's military to grow their force so they do not have to rely on outside help when disaster strikes. This, in turn, does not require the United States to aide every

---

<sup>51</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>52</sup> DiPaolo, Lt Col Marc C.; dePalo, Colonel Lee K.; Healy, Colonel Michael T.; Hecht, Colonel Glenn; and Trumpfheller, Lt Col Mike. *A Rescue Force for the World: Adapting Airpower to the Realities of the Long War*. Air and Space Power Journal – Fall 2007. On line at <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj07/fal07/dipaolo.html>

country when they need help. Air Force Rescue forces can do these through exercises, education, military-to-military contact, and other methods. The 563<sup>rd</sup> Rescue Group, through 12<sup>th</sup> Air Force at Davis-Monthan, conducted numerous engagement activities with South American nations including Chile, Argentina, and Brazil to name a few. The ROC can further support this when aircraft and pararescue personnel travel to any country for engagement opportunities.

The whole thrust of establishing the ROC is the requirement to decentralize the control of your forces as you get into more lower-intensity conflicts while maintaining the critical link with the military command structure. This is normally along the lines of humanitarian assistance to civil support, small-scale military operations, and building partnership capacity. However, the applicability for MCO is still there. The inclusion of the interagency in all missions across the range of military operations drives the need for a forward deployed C2 node that has better localized situational awareness than other entities. It is absolutely necessary to decentralize mission control to where your decision makers are, in this case, downrange. The ROC's migration forward allows the senior Airman in charge the flexibility to levy that responsibility and trust the Rescue Commander who is making the ultimate decision on the frontlines. As Kometer said, "...we must retain our C2 capability while becoming flatter – attaining faster response by eliminating some hierarchical levels in favor of pushing information out to all players at the lower levels."<sup>53</sup> This is exactly what the ROC does. It improves communications, the decision-making process, and helps decentralization of control functions from the Combined

---

<sup>53</sup> Kometer, Michael W. *Command in Air War, Centralized versus Decentralized Control of Combat Airpower*. Air University Press, Maxwell AFB, AL, June 2007, p.4-5.

Air Operations Center (CAOC) under a Rescue Commander with tremendous situational awareness and connectivity.<sup>54</sup>

### **Recommendations/Way-ahead**

The Air Force has already codified personnel recovery as an Air Force core function. To further codify the personnel recovery requirement, the Air Force Chief of Staff recently approved the Operational Concept for Personnel Recovery in October 2009. With this guidance in place, the Air Force and Air Combat Command must now define the concept by crafting functional concepts in three areas: Personnel Recovery commanders, staffs, and C2; forces dedicated to PR; and isolated personnel.<sup>55</sup> Upon completion of the functional concepts, the Rescue Operations Center would have an enabling concept that falls under the Personnel Recovery commanders, staffs, and C2 operational concept. The enabling concept would then describe the systems, personnel, training, and other important facets of how the ROC operates. To test the system, ACC needs to continue to fund the ANGEL THUNDER and RESOLUTE ANGEL exercise series events. These exercises bring all aspects of the DoD, Interagency, and select international communities together to practice scenarios across the personnel recovery spectrum that are not exercised on a regular basis.

In addition to formalizing the ROC's doctrine, training, and operational requirements, ACC must improve the ROC's communication suite, allow for the shortening of Rescue's decision-making process, and decentralize control functions from the Combined Air Operations Center (CAOC) to the lowest possible level. This does not normally include Major Combat Operations where the CAOC already has a Joint Personnel Recovery Cell (JPRC) to coordinate

---

<sup>54</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

<sup>55</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 16 October 2009.

across the entire joint operations area.<sup>56</sup> Where it is necessary to establish a ROC is during operations in need of PR support, such as humanitarian relief, disaster relief, and other type operations. In addition, the ROC will provide huge benefits any time Air Force Rescue forces are supporting CONUS operations and the interagency is involved.

The USAF for too long has insisted on equipping Rescue units for deployment to bases that provide base operational support. But as OIF showed, that is not the case when it comes to CSAR units. We need to make the assumption that we will need to operate without any support of any kind.<sup>57</sup> The ROC will fix this problem. According to Colonel Todorov, the Special Assistant to General Renuart, USNORTHCOM commander, "For the ROC to be resourced and fully come to fruition, it cannot be viewed as a "Service (Air Force) asset" but rather must appeal to a wide variety of COCOM interests in an array of environments (MCO, ROMO, DSCA, HUMRO, et al). To begin that process, the Air Force must first establish the ROC as a UTC (like AFSOCs 9AAHQ headquarters UTC), and demonstrate its capabilities and value in a variety of scenarios. Only when COCOMs and their planners begin to view the ROC as essential to the success of their operations, will the future of the ROC be guaranteed."<sup>58</sup>

## **Conclusion**

Establishing a Rescue Operations Center will ensure the Rescue Force commander has adequate command-and-control of his forces across the range of military operations. It provides streamlined communication, enhances the decision-making process, and allows decentralization of C2 functions away from the JPRC at the CAOC when the mission dictates. The ROC is a distinct capability the Air Force needs as it continues to transform. It

---

<sup>56</sup> Joint Chiefs of Staff. Joint Publication 3-50, *Personnel Recovery*, 5 January 2007, p. B-4.

<sup>57</sup> Callahan, Brigadier General Joseph, Joint Staff J-5, The Pentagon, VA. To the author. E-mail, 13 November 2009.

<sup>58</sup> Todorov, Colonel Kenneth, NORTHCOM Special Assistant to the Commander, NORTHCOM, Petersen AFB, CO. To the author. E-mail, 14 December 2009.

allows the Air Force's Rescue forces to be fully operational in less time and permits missions to start quicker, and the rescuing of personnel to start earlier. The ROC also gives the commander at the lower-level the ability to monitor and move forces to where it is absolutely necessary while maintaining that essential link to command elements for accountability and mission oversight.<sup>59</sup>

The ROC, although built at the tactical level, showed its effectiveness during Hurricane Gustav and Ike relief operations. To ensure sustainability, it must have advocacy and sponsorship at the service and major command levels. This support will ensure the operations center has the correct funding and manning to support current and future operational missions. In addition, the major commands must socialize this unique capability to the combatant commands so they understand what it can provide. Although the Air Force is the only service with assets dedicated specifically to personnel recovery, Air Force Rescue forces do not perform CSAR only. As seen in OEF and OIF, Central Command (CENTCOM) began using these forces in support of non-CSAR missions in Iraq and Afghanistan and they continue to do so to this day. An established ROC will guarantee an effective C2 and communications infrastructure for Rescue Forces as this trend continues into the foreseeable future.

---

<sup>59</sup> Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.



## Bibliography

Air Combat Command 2008 Strategic Plan. Securing the High Ground: Dominant Combat Air Force for America. 28 July 2008.

Air Force Doctrine Document (AFDD) 1. *Air Force Basic Doctrine*, 17 November 2003.

Air Force Doctrine Document (AFDD) 2-1.6. *Personnel Recovery Operations*, 1 June 2005.

Air Force Doctrine Document (AFDD) 2-3. *Irregular Warfare*, 1 August 2007.

Air Force Doctrine Document (AFDD) 2-7. *Special Operations*, 16 December 2005.

Air Force Doctrine Document (AFDD) 2-8. *Command and Control*, 1 June 2007.

Air Force Pararescue: Encyclopedia. [http://en.allexperts.com/e/a/ai/air\\_force\\_pararescue.htm](http://en.allexperts.com/e/a/ai/air_force_pararescue.htm), accessed 14 December 2009.

Bissonnette, Stephen H. *Joint CSAR – Does the Current Organization Provide the Joint Task Force with the Most Effective Tools*. Naval Command and Staff College, 4 February 2002.

Briefing. Department of Defense (DOD) Defense POW/Missing Personnel Office. 2004 Annual Report.

Briefing to General Renuart. 23rd Wing. Subject: Rescue Operations Center, 26 July 2009.

Briefing to 23rd Wing Commanders Conference. Subject: Personnel Recovery Defined, 27 October 2009.

Briefing to 85<sup>th</sup> Group Commander. 56<sup>th</sup> Rescue Squadron. Subject: Personnel Recovery Capabilities, 10 August 2003.

Briefing. United States Air Force Roadmap 2006-2025. June 2006.

Callahan, Colonel Joseph. After Action Report. 347 Expeditionary Rescue Group, 22 September 2005.

Callahan, Brigadier General Joseph, Joint Staff J-5, The Pentagon, VA. To the author. E-mail, 13 November 2009.

Christie, Frances and Hanlon, Joseph. *Mozambique & The Great Flood of 2000*. Oxford, England and Bloomington, IN: The International African Institute, 2001.

Cline, John D. “*Under New Management: Will America’s Dedicated CSAR Forces Finally Strive in AFSOC?*” Naval Post-Graduate School, 2004.

dePalo, Colonel Lee, Vice Commander, 13 Wing, Andrews AFB, MD. To the author. E-mail, 12 February 2010.

dePalo, Colonel Lee. *USAF Combat Search and Rescue: Untapped Combat Power*. Air War College Maxwell Paper Number 35. Air University Press, Maxwell AFB, AL, September 2005.

dePalo, Colonel Lee. *USAF Combat Search and Rescue: Ineffective Utilization in the Global War on Terrorism*. Air War College, Maxwell AFB, AL, 1 February 2005.

DiPaolo, Lt Col Marc C.; dePalo, Colonel Lee K.; Healy, Colonel Michael T.; Hecht, Colonel Glenn; and Trumpfheller, Lt Col Mike. *A Rescue Force for the World: Adapting Airpower to the Realities of the Long War*. Air and Space Power Journal – Fall 2007. On line at <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj07/fal07/dipaolo.html>

Department of Defense (DOD) Defense Prisoner of War/Missing Personnel Office. Strategic Plan 2005-2010. January 2005.

Department of Defense (DOD) Directive 3000.07. *Irregular Warfare (IW)*, 1 December 2008.

Department of Defense (DOD) Directive 3002.01E. *Personnel Recovery in the Department of Defense*, 16 April 2009.

Department of Defense (DOD) Directive 3003.01. *DOD Support to Civil Search and Rescue (SAR)*, 20 January 2006.

Department of Defense Joint Operating Concept. *Irregular Warfare*. 11 September 2007.

Elleman, Bruce A. *Waves of Hope: The U.S. Navy’s Response to the Tsunami in Northern Indonesia*. Naval War College Papers 28, Newport, RI, February 2007.

Hartnett, Brett A. Major. After Action Report: Combat Rescue Ground Operations at the U.S. Embassy, Monrovia, Liberia, 23 July 2003.

Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 24 November 2009.

Hecht, Colonel Glenn, Air Combat Command Staff A-9, Langley AFB, VA. To the author. E-mail, 30 December 2009.

Hinote, Clint. *Centralized Control and Decentralized Execution*. Research Paper 2009-1. Maxwell AFB, AL: Air Force Research Institute, March 2009.

Joint Chiefs of Staff. Joint Publication 1, *Doctrine for the Forces of the United States*, 20 March 2009.

Joint Chiefs of Staff. Joint Publication 3-50, *Personnel Recovery*, 5 January 2007.

Jolly Green Association Page. "That Others May Live." <http://www.jollygreen.org> accessed 14 December 2009.

Kometer, Michael W. *Command in Air War, Centralized versus Decentralized Control of Combat Airpower*. Air University Press, Maxwell AFB, AL, June 2007.

Koskinas, Ioannis. *Black and White Hats: The Effect of Organizational Culture and Institutional Identity on the Twenty-third Air Force*. CADRE Paper No. 24. Maxwell AFB, AL: College of Aerospace Doctrine, Research and Education, December 2006.

Kuehn, James. "PR/CSAR: A USSOCOM Core Task?" Air Command and Staff College, 2005.

Latta, Clifford W. Lt Col. *U.S. Air Force Air Combat Command Takes Control of Combat Search and Rescue: An opportunity to Re-energize the Unity of Effort*. Naval War College, 15 May 2006.

Meggett, David C. *Evolution of Rescue: Personnel Recovery for a New Environment*. Naval Post Graduate School, Monterey, CA, December 2007.

Miskel, James F. *Disaster Response and Homeland Security: What Works, What Doesn't*. Westport, CT: Praeger Security International, 2006.

Moseley, General T. Michael. *America's Air Force: The Nation's Guardian*. Joint Forces Quarterly, Issue 49, 2d Quarter 2008, [www.ndupress.ndu.edu](http://www.ndupress.ndu.edu).

Sandie, Malachy. *JTF-CSAR-A More Effective Organization for the Joint Forces Commander*. Naval War College, 9 February 2004.

Smith, Charles R. *Angels from the Sea: Relief Operations in Bangladesh, 1991, U.S. Marines in Humanitarian Operations*. History and Museums Division, HQ U.S. Marine Corps, Washington D.C., 1995.

Special Operations.com website.  
[http://www.specialoperations.com/Operations/Atlas\\_Response/Default.com](http://www.specialoperations.com/Operations/Atlas_Response/Default.com); accessed 11 February 2010.

Thompson, Billy D. *For Valor or Value An Examination of Personnel Recovery Operations*. School of Advanced Aerospace Studies, Maxwell AFB, AL, June 2001.

Todorov, Colonel Kenneth, NORTHCOM Special Assistant to the Commander, NORTHCOM, Petersen AFB, CO. To the author. E-mail, 14 December 2009.

United States Air Force Operational Concept for Personnel Recovery 2009. General Norton A. Schwartz, 4 September 2009.

United States Air Force Posture Statement. The Honorable Michael B. Donley and General Norton A. Schwartz, 19 May 2009.

US Senate. *Hurricane Katrina: A Nation Still Unprepared*. Special Report of the Committee on Homeland Security and Governmental Affairs, 109<sup>th</sup> Cong., 2<sup>nd</sup> sess., S.Rept 109-332.

USAF Pararescue – That Others May Live; <http://www.pararescue.com/>; accessed 14 December 2009.

Whitcomb, Darrel D. *Combat Search and Rescue in Desert Storm*. Air University Press, Maxwell AFB, AL, September 2006.

Wormley, Michael A. *Combat Search and Rescue: Searching the History; Rescuing the Doctrine*. School of Advanced Aerospace Studies, Maxwell AFB, AL, June 2003.